"Management on Integrating Technology Into Instruction In State, Universities And Colleges In the Autonomous Region In Muslim Mindanao"

Abstract: The study primarily aimed to determine the efficiency and effectiveness of the management on integrating technology in instruction in State Universities and Colleges in the Autonomous Region in Muslim Mindanao where faculty and administrators are the respondents. Specifically this study sought to answer questions dealing with: 1) Profile of the faculty and administrators in terms of gender, civil status, highest educational attainment, academic rank, length of service, and teaching load; 2) the management strategies used in integrating technology in instruction; 4) relationship between the management strategies and respondent’s profile; 5) relationship between management strategies and the problems/obstacles; 6) relationship among management strategies; 7) difference between the perceptions of administrators and faculty; 8) a proposed planning guide and model for management of technology in instruction.

Keywords: Management, Integrating Technology.

INTRODUCTION

The respondents were 370 faculty and 46 administrators from four State Universities, and Colleges in the Autonomous Region in Muslim Mindanao namely; Adiong Memorial Polytechnic College, Tawi-Tawi Regional Agricultural College, Basilan State College, Sulu State College and Mindanao State University.

The descriptive-correlation method of research was used in the study with the questionnaire as the main instrument. The statistical treatments employed were frequency distribution, percentage and weighted mean to determine the profile of the respondents. Pearson Correlation was used to determine the differences of the perception of both faculty and administrators as respondents.

In State Universities and Colleges of ARMM, the typical faculty of the State Universities and Colleges in Autonomous Region in Muslim Mindanao is instructor, female, married, masters’ degree holder, with 19-21 units and has been teaching for 1-5 years.

The response of the faculty and administrators of SUC-ARMM in the management strategies on integrating technology into instruction in moderately implemented in terms of planning, professional development, integrating technology, control and budgeting. Generally, the management strategy of technology integration into instruction is moderately efficient and effective. These data can guide institutions to examine their current technology practices and provide grounds to make sound technology-related decisions that can maximize student learning. To better understand the integration of technology into instruction, some authors have approached the topic from change management and diffusion of innovation perspectives rather than introducing new technologies, Kershaw (1996) believes successful technology integration focuses on managing change effectively.

Furthermore, due to technologies importance in State, Universities and Colleges, the study identified the obstacles to the integration of technology into instruction that would be an important step in improving the quality of instruction. As such, power interruption and fluctuation which cause damages to the technology resources and outdated network and poor connectivity are the leading obstacles.
Moreover, the relationship between respondent’s profile and management strategies were statistically significant only to “academic rank and management control” and “Educational attainment and professional development” Thus, obstacles greatly affect the management strategies in integrating technology into instruction. However, the correlation coefficient was negative which implies that as the management increases its efficiency and effectiveness, the more reduction of obstacles. As a results of the relationship among management strategies, indicated a highly significant to all management strategies, it is further concluded that, management strategies are interrelated in terms of planning, professional development, integrating technology, control and budgeting. Thus, there were no differences in the perception and response of the faculty and administrators in all variables.

As far as the results of the study are concerned, the following recommendations to administrators, faculty, the community, researchers, and students are hereby enumerated; 1) The State University and Colleges in need to strengthen the professional development of the faculty to pursue higher education in order to be ready for all challenges in their field of endeavour as their service lengthens, and as their experience ready for taking the next step in Technology Integration in preparation for 21st century global context 2) The management strategies on integrating technology into instruction in State University and Colleges should include the corporate strategy for technology sourcing and financial support based on inputs from available technology and management as a whole. All the management strategies are interrelated and should be addressed as one in terms of planning, integrating technology, professional development, control and budgeting including corporate strategies. Failure of one leads to the failure of the entire management. 4) in order to minimize or reduce the occurrence of obstacles in technology integration, the management should strengthen and increase in terms of implementation, efficiency and effectiveness. As management increases, the occurrence of obstacles decreases. 5) Faculty with highest academic rank and educational attainment are good managers and administrators in implementing technology integration. 6) there is a need to conduct further study on technology, learning and leading to educational imperatives for a 21st century. This is recognizing the changes in environment that are possible as a result of the presence of technology and its potential impact on learning the proposed programs and model in the management of integrating technology. 7) Proposed programs for technology planning guides and model in management integration should be adopted or serve as reference for all SUC-ARMM.

Finally, the proposed management model for integrating technology in instruction is recommended for the SUCs not only in the ARMM but for all those in the MINSUPALA region.

THE PROBLEM AND ITS SCOPE

Rationale

State Universities and Colleges (SUCs) have three focal functions such as instruction, research and extension. Lately, production by way of income generating programs has emerged to augment the limited budgetary assistance extended by the government to all Higher Education Institutions (HEIs).

Instruction focuses on the process of facilitating the acquisition of knowledge and skills to develop the analytical and creative faculties of learners. It also includes other specific tasks, such as student consultation, academic advising, and all other initiatives that facilitate the process of learning. Thus, instruction is grounded in an understanding of how people learn. Instruction begins with an assessment of what students already know, and builds new concepts on their existing knowledge. Differentiation provides students with varied experiences to engage with content. At the beginning of the new century, higher education institutions faced a set of pervasive challenges and opportunities brought about by the changing global economic and social conditions. The closing years of the 20th century were characterized by knowledge explosion, scientific breakthroughs, and technological advancement, particularly in information and communication, and rapid technology diffusion.

In line with the thrust of education for sustainable development, the Commission on Higher Education (CHED) adopted a project called the Centers of Excellence. It is an inherent mandate of the CHED as outlined in Republic Act 7722 (Higher Education Act). The Centers of Excellence project aims to identify institutions with qualities indicating excellence in instruction, research and extension. These institutions are supported by CHED to attain world-class levels. Colleges and universities are making sizable investments in computer-related technologies to support and enhance instruction (Massy & Zemsky, 1996). However, many faculty simply are not using technology into instruction (Rice & Miller, 2001).

On the other hand Technology can and does help students develop all kinds of skills—from the basic to the higher-order critical thinking ones. However, for technology to be successful, teachers need to make informed choices elating to pedagogical approach, students’ needs, and learning objectives. Just as important as what technology is used, is how learning can be enhanced through technology (Strommen and Lincoln, 1992,p. 473).
Moreover, a teacher’s philosophy of education and pedagogical praxis must play a vital role in forming one’s theoretical framework for technology integration. “Technology are being asked to learn new methods of teaching, while at the same time they are facing even greater challenges of rapidly increasing technological changes and greater diversity in the classroom” (U.S. Department of Education, 1999).

Thus, technology has moved from chalkboards and text books to complex interactive media, complete systems of distance learning, e-learning, and virtual school with customized pacing for individual students (Rotherhams, 2006). The technology that has so dramatically changed the world outside the school is now changing the learning and teaching environment within them. This change is driven by an increasingly competitive global economy and the students themselves, who are “born and comfortable in the age of internet (U.S. Department of Education, 2005).

The pressure to reform education through technology integration (Becker, 2001) and the emphasis on developing information literacy skills for students (Rockman, 2004) implies the need for an understanding of current computer technology integration practices to support student learning. In a large scale, nationwide survey of teachers, students, and administrators conducted for the Gates Foundation, Abbott (2003) found that over 53% of the teachers they surveyed do not routinely use technology in the classroom and over half the students responding to questionnaires reported they use neither technology nor more than once a week. This survey found that 80% of teachers are using computers mainly for administrative functions and only slightly more than half are integrating computers into their routine instruction (National Teachers Survey, 2005). The survey revealed teacher technology training has focused on administrative applications, rather than instructional applications. Even more concerning is approximately one third of teachers have received little or no training with integrating computers into lessons or training on instructional software.

Cuban (2001) argues that computers have been oversold by policy makers and advocates of technology use in education, but have not been effectively integrated into instruction. Further, knowledge of effective integration of technology into classroom instruction is not readily available. Cuban (2001) contends that remarkable changes have occurred in how students use computers in various places including their dormitories, libraries, and elsewhere on wired campuses, but a bleak side exists on how these tools are used for classroom instruction. While availability and access to instructional computer use have increased tremendously in higher education classrooms (Green, 2001), few faculty have demonstrated effective and efficient computer technology integration use in their classrooms (Cuban, 2001).

At the same time, there is evidence that technology is changing the way instructions are teaching in their classes. For instance, in a study about the effectiveness of technology in schools, Sivin-Kachala and Bialo (2000) reported positive and consistent patterns when students were engaged in technology-rich environments. Even so, reports indicate that faculty members are not using technology in ways that make a difference in student learning (Anderson, 2000; Cuban, 2001; McCannon & Crews, 2000). Regrettably, technology integration is lacking throughout the educational curriculum (International Society for Technology in Education, 2000).

According to its technology integration plan for education, Hongkong has taken the following initiatives, among others, of (1) offering technical support on a contractual basis to schools, (2) opening school laboratory after school hours for students to increase access, (3) implementing a pilot scheme of demonstration schools with a view to establishing best practices in ICT education similar to countries such as Australia and Singapore, and (4) setting up a nationwide school network similar to countries such as Singapore, Australia, and Mauritius. It also lays much emphasis on issues of access and connectivity, teacher empowerment, curriculum and resource support, and community-wide culture that fosters more involvement and collaboration among school management, teachers, students, parents, the business sector and other community bodies (Education and Manpower Bureau, 2004). Furthermore, while the Malaysian Smart School Project plan (Ministry of Education of Malaysia, 1998) stipulates the setting up of a Teacher’s Room resourced with Internet access, access to educational databases and professional networking tools, the government of New Zealand emphasizes the empowerment of not only teachers but school administrators as well in the use of ICT.

While various studies have explored the factors that enhance integration of technology into instruction as well as the barriers or obstacles to effective technology integration, few studies are available on students’ perceptions of computer technology use and the impact of these perceptions on their learning. In addition, while the public interest in the use and integration of computer technology in education is growing, research in this area is still in its infancy, especially that which focus on classroom instruction. Besides, rapid improvement in educational technologies exceeds the current knowledge of effective technology use in education (Allen, 2001) and implies the need for a study such as this.
However, SUCs in other region has already implemented the integration of technology into instruction. Understanding administrators and faculty’s perception of technology integration into instruction will help State, Universities and colleges to improve their technology management. Knowledge of how follow-up mentoring systems will help teachers better integrate technology may also inform school administrators and policy-makers in regards to providing more effective instructional and technology support, gaining the most benefit from investments made on professional development on integrating technology into instruction in State Universities and Colleges of the Autonomous Region in Muslim Mindanao and provides proposed planning guidelines and model for technology integration based on the finding and analysis of the study.

THEORETICAL FRAMEWORK
This part consist of theories that have a bearing on the problem of the study and lent support to the foundations of this research. In this sense, there is an ideological fervor that borders on evangelism, practically rejecting all other perspectives as heresy (Perkins, 1991). It is as if the constructivist approach were the only way to efficiently and effectively implement the integration of technology into instruction. What is the place and role of other more direct approaches to technology and instruction (teaching and Learning)? This study seeks to revisit the literature about different approaches and theories (Constructivism, directed instruction, cognitive constructivism, social constructivism, constructionism, connectivism, modern management-system approach and contingency approach, theories of work motivation, Abraham Maslow of Hierarchy of Needs, Herzbergs’ Two-Factor Theory, and McClellands’ Theory) That could be applied to the management on integrating technology into instruction of faculty and administrators in State, Universities and Colleges.

Most of the recent studies and recommendations put emphasis on only one approach: constructivism. In this sense, there is an ideological fervor that borders on evangelism, practically rejecting all other perspectives as heresy (Perkins, 1991). It is as if the constructivist approach were the only way to resolve educational goals change according to new social needs, and do strategies for integrating technology into teaching and learning. Lately, there have been disagreements among learning theories about which strategies will prove most effective in achieving today’s educational goals. This dispute has served as a catalyst for two very different models of teaching and learning: directed instruction and constructivism (Roller et al., 1997).

Directed instruction is grounded primarily in behaviourist learning theory and the information-processing branch of the cognitive learning theories. The constructivism view, on the other hand, evolved from other aspects of the cognitive learning theory. A few technology applications (e.g., drill and practice, tutorials) are associated only with directed instruction; most others (e.g., problem solving, multimedia applications, and telecommunications) can enhance either directed instruction or constructivist environments, depending on how teachers integrated them into classroom instruction. In Directed Instruction, the earliest uses of computers to aid instruction based their instructional models on the work of behaviourists such as B.F. Skinner, whose followers considered that computers were able to provide drill and practice on previously learned skills. The stimulus response interaction between student and technology was the dominant paradigm. Skinner and other behaviourists viewed the teacher’s job as modifying the behaviour of students through positive reinforcement. These behavioural principles underlay the following two well-known trends in education: Behaviour modification techniques in classroom management, and programmed instruction. Although current use of programmed instruction itself is limited, its principles form much of the basis of effective drill and practice and tutorial software.

Information-processing theories emerged from a branch of cognitive psychology that focused on the memory and storage processes that enable learning. A theorist in this area explored how a person receives information and stores it in memory, the structure of memory that allows the learning of something new to relate to and build on something learned previously, and how a learner retrieves information from short-term and long-term memory and applies it to new situations. One well-known information-processing theorist was David, who proposed that the way a learner receives and stores information affects the usefulness of the information, for example, by transferring current learning to learning other skills. Roblyer et al., 1997 identified four major needs addressed by computerized directed instruction. They are individual pacing and remediation, especially when teacher time is limited. Making learning paths more efficient, especially for instruction in skills that are prerequisite to higher level skills; performing time-consuming and labor-intensive task, freeing teaching time for other, more complex student need; and supplying self-instructional sequences, especially when human teachers are not available, teacher time for structured review is limited, and/or students are already highly motivated to learn skills. The behaviourist and information-processing theories have not only helped establish key concepts such as types of learning and instructional conditions required to bring about such each type; they also laid the groundwork for more efficient methods of creating directed instruction. The directed method approaches, however, have faced some problems. For example, students cannot do problem solving and they find directed instruction activities un-motivating and irrelevant.
Constructivism is a theory of learning that describes how our minds create knowledge or how a student’s knowledge structures and “…deeper conceptual understanding” come about (Fosnot, 1996). A constructivist perspective views learners as actively engaged in making meaning, and teaching with that approach looks for what students can analyse, investigate, collaborate, share, build and generate based on what they already know, rather than what facts, skills, and processes they can learn from others. To do this effectively, teachers need to be learners and researchers, to strive for greater awareness of the environments and the participants in a given teaching situation in order to continually adjust their actions to engage students in learning, using constructivism as a referent. Constructivist activities ask students to intentionally bring forth their own relevant mental models and attempt to integrate external information within these personal frameworks (Glynn & Duit, 1995; Novak, 1995). To help the learner integrate new ideas with his or her own familiar model, constructivists recommend grounding activities in everyday contexts such as realistic cases, expressing topics to be learned. Piaget, Papert, and Vygotsky are representatives of different types of constructivism.

Thus, Constructivism focuses on knowledge construction, not knowledge reproduction. Education is being partially transformed by new technologies. At one time students could learn a small, but fixed body of knowledge. However, today, the enormous amount of available information, coupled with the fact that the amount of knowledge in the world continues to double at an increasingly quick rate, requires a transformative approach to education. It is imperative that the student of today learns how to be an information manager, rather than in information repeater (Mann, 1994). In a technology-rich environment one must remember that the educational focus is on learning and instructional goals instead of the technology itself, because technology is merely tools or vehicles for delivering instruction (Campoy, 1992). It is not what equipment is used, but how the equipment is used which makes it relevant to a constructivist classroom (Strommen and Lincoln, 1992). Cognitive Constructivism is based on the work of Jean Piaget. Piaget’s theory has two major parts: one component that predicts what children can and cannot understand at different ages, and a theory of development that describes how children develop cognitive abilities. There are two key Piagetian implications for teaching and learning. First, learning is an active process where direct experience, making errors, and looking for solutions is vital for the assimilation and accommodation of information. How information is presented is important. When information is introduced as an aid to problem solving, it functions as a tool rather than an isolated arbitrary fact. Second, learning should be whole, authentic, and “real.” In a Piagetian classroom there is less emphasis on directly teaching specific skills and more emphasis on learning in a meaningful context. Technology, particularly multimedia, offers a vast array of such opportunities (Chen, 2000). With technology support such as videodisks and CD-ROMs, teachers can provide learning environment that helps expand the conceptual and experiential background of the reader. Although much of the educational software created in the 1970s and 1980s was based on behavioural principles, much of the new multimedia educational software is based on constructivist theorist. Within the field of educational computing, the best-known cognitive constructivist theoretician is Papert (Chen, 2000).

Unlike Piaget, Papert (1993) uses the term “constructionism” to brand his favoured approach to learning. Constructionism is built on the assumption that children will do best by finding (“Fishing”) for themselves the specific knowledge they need. Organized or informal education can help most by making sure they are supported morally, psychologically, materially, and intellectually in their efforts” (Papert, p. 139). As such, “the goal is to teach in such a way as to produce the most learning for the least teaching.” As examples of constructionist learning activities, Papert refers, amongst others, to measuring quantities while making a cake, building with Lego or working with the computer programming language LOGO developed specifically by Papert and colleagues for educational use. Papert’s philosophy of learning and his constructionist approach rely on the computer for realization. He postulates that the computer, and particularly, its future development, will change children’s relationship with knowledge, producing a revolution comparable to that of the advent of printing and writing. He imagines a machine he refers to as “The Knowledge Machine”, which would allow children a rich exploration of the world. While the computer offers “new opportunities to craft alternatives, moving from present epistemology and approach in schools will, in Papert’s view, require “mega change”. Little schools, involvement of community, encouragement of educational diversity, decentralization, fostering of personal teaching styles, and the involvement of parents, teachers and students: these are to be the prime ingredients of change to embark on the revolution necessary to move into “the age of learning”. Vygotsky’s constructivist theory, which is often called social constructivism, has much more room for an active, involved teacher than cognitive constructivism. The central point of our psychology, Vygotsky claimed, is mediation. Through mediation – material and semiotic – human cognition engages in relationships with the material and social environment that are fundamentally different from non-mediated relationships.
In Vygotsky’s view, the use of technology to connect rather than separate students from one another would be appropriate. Teachers, thus, can facilitate cognitive growth and learning as can peers and other members of the child’s community. At present, interest in constructivist methods is on the rise. Robin and Harris (1998) found that technology-using teacher educator are generally learner-centered in their teaching styles, have higher levels of formal schooling, are more often female than male, and prefer to learn by concrete experience. Most frequently, proponents of information technologies in education speak of assisting student-centered learning through technology’s ability to access, store, manipulate and analyse information, thereby enabling learners to spend less time gathering information and more time reflecting on its meaning (Robin & Harris, 1998). Roblyer et al. (1997) identified four major instructional needs met by the constructivist model. The are making skills more relevant to students’ backgrounds and experiences by anchoring learning tasks in meaningful, authentic, highly visual situations; addressing motivation problems through interactive activities in which students must play active rather than passive roles; teaching students how to work together solve problems through group-based, cooperative learning activities; and emphasizing engaging, motivational activities that require higher-level skills and prerequisite lower-level skills at the same time. Despite the current popularity of constructivism, its principles and practices have also stimulated a variety of criticism. For example, under the constructivist approach, it is difficult to certify skill learning and to determine the amount of prior knowledge needed. Additionally, there has been little evidence that indicates that problem-solving skills taught inauthentic situations in school will transfer more easily to problems that students must solve in real life (Roblyer, et al., 1997). On the other hand, the theory of Siemens (2005) on “connectivism” calls for a rethinking of learning in the digital age, illustrating that technology has led to a new learning theory. To date, theories of behaviourism, cognitivism, and constructivism have dominated instructional design and still have their place the domains of learning. However, these theories are challenged in the digital age because many of the processes previously handled by learning theories) especially in cognitive information processing) can now be off-loaded to, or supported by, technology. In contrast to established theories of learning, the essence of connectivism, Siemens said, is that learning is viewed as a connections/network-forming process.

Moreover, connectivism recognizes that learning resides in collective individuals’ opinion and even in non-human applications, core skills include an ability to see connections between fields, ideas, and concepts and to locate sources of unknown knowledge when you need it at its point of application. Because knowledge is increasing exponentially, it can rapidly change what is perceived as a reality. Thus, the decision making process (what to learn and its meaning) is a learning process itself. The process is complicated by new communication tools that have sprung up, which give greater end-user control over what is published on the Web, resulting in some amateur contributions of questionable quality.

Modern management is characterized by two approaches, the systems and the contingency approach. The systems approach views the organization as a total system, comprised of interacting subsystems, all of which are in complex interaction with the relevant external environment (Lerman and Turner, 1992). Organizations are pictured as “input-transformation-output systems” that compete for resources. The survival and prosperity of an organization depend on effective adaption its outputs (products and services), obtaining necessary resources, and dealing with external threats.

Interestingly, theories that explain management effectiveness in terms of situational moderator variables are called contingency theories. The contingency or situational approach recognizes that neither the democratic nor the autocratic extreme is effective in all extension management situations. Different traits are inquired in different situations.

Berzonsky (1994), citing Gray and Strake, stated that theories of work motivation maybe categorized into two broad areas: universalistic theories and contingency theories. Universalistic theories attempt to posit, widespread applicably to work environment while contingency theories focus on individual differences that influence motivational levels.

Perhaps the most widely used theory of motivational is Abraham Maslow of Hierarchy of needs (1943) which proposes that human behaviour is a result of people attempts to satisfy currently unsatisfied needs. Such needs are arranged in a hierarchical order such that the satisfaction of a prior level of need leads to a need for satisfaction at succeeding level.

Another often cited theory is Herzberg’s Two – Factor theory (F. Herzberg, B. Mausner, and B. Syndermon, 1959), which asserts that job satisfaction and dissatisfaction are conceptually different, being caused by different work-related factor (Berzonsky, 1994). This indicates that two sets factors or conditions influence the behaviour of employees. The first set has virtually no effect on motivating employees. If withdrawn from the workplace, however, these factors called maintenance or hygiene factors tend to cause dissatisfaction. Hezberg borrowed the term hygiene from the medical field which refers to factors that help maintain, but do not necessarily improve health (Kossen, 1981).
The following are what Herzberg caked hygiene or maintenance factors (Kossen, 1981): 1) company policy and administrations, 2) relationship with the supervisor, 3) interpersonal relations with the supervisors, subordinates and peers, 4) salary and certain types and fringe benefits, and 5) working conditions and job security.

The last notable theory related to the study is McClelland and his associates, selected three needs which considered most salient 1) power (satisfaction from controlling others); 2) affiliation (satisfaction from social and interpersonal activities); 3) achievement (satisfaction from reaching one’s goal). Much of McClelland’s research further expounds on this third need and its influence on organizational functioning (Berzonsky, 1994).

Furthermore, believing that acquiring the hardware and the software package will resolve the problem is denying the importance of the human mind and capacity to choose. However, the machine cannot make the choice of pedagogical approach. Whether to use one approach or the other is up to the faculty and administrators, institutions, and the students. Educational practitioners, who are looking for the best means to facilitate a diversity of learning styles, can’t afford the luxury of being so ideological and exclusionary in their view of education. Educational technologist need to be more pragmatic and electric, drawing from diverse theoretical perspectives as each proves useful in facilitating different kinds of learning. Educators need to be competent observe of the social milieu in which learners interact as well as knowledgeable about the content to which they wish to expose learners. All the approaches and theories presented above could be used alternatively as long as educators have in mind why they chose them.

**Conceptual Framework**

The paradigm describes the independent, and the dependent variable of the study. As shown, the independent variables are the profile of the respondents from the Higher Education Institution (HEIs), considered in terms of their gender, civil status, educational qualification, academic rank, length of service and teaching load. The dependent variables are the management strategies in terms of planning, this conceptual framework is based on the premise that the independent variables are related to the management strategies when technology is integrated in instruction of the State Universities and Colleges of the Autonomous Region in Muslim Mindanao.

If technology is to be integrated into the instruction, the meaning of educational leadership and the role of administrators in management and technological change must be refined (Bennett, 1996). Furthermore, when the schools implemented and IT project, this new technology possessed challenges to the school culture (Friedman, 1994). These challenges have to be clearly identified and managed. Using this approach, Friedman (1994) stressed that proper management over technology integration in schools is important Management over technology should be part of the overall school management.
Statement of the Problem
This study was conducted to determine the management of integrating technology in instruction of the State Universities and Colleges (SUCs) of the Autonomous Region in Muslim Mindanao (ARMM) for school year 2011-2012.

The following research questions were investigated in the study:
1. What is the descriptive profile of the respondents in terms of the following?
   1.1. Gender
   1.2. Civil status
   1.3. Educational qualification
   1.4. Academic rank
   1.5. Length of service and
   1.6. Teaching load
2. What management strategies do the respondents have in integrating technology into instruction in terms of the following?
   2.1. Planning
   2.2. Integrating technology
   2.3. Professional development
   2.4. Control and
   2.5. Budgeting
3. What are the obstacles in the management of integrating technology into instruction?
4. What is the relationship between the management and the respondents’ profile?
5. What is the relationship of the obstacles occurrence and management strategies?
6. What is the relationship among management strategies in integrating technology into instruction?
7. Is there a difference between the perceptions of administrators and faculty on integrating technology into instruction?
8. What management model may be proposed based on the finding of the study?

The Hypotheses
The following hypotheses were tested at .05 level of significance:
HO1: There is no significant relationship between profile and management strategies.
HO2: There is no significant relationship between obstacles occurrence and management strategies.
HO3: There is no significant relationship among management strategies in integrating technology in instruction.
HO4: There is no significant difference between the perceptions of administrators and faculty.

Significant of the Study
This study is deemed significant of the following:
State Universities and Colleges. The results of this research may serve as frame of reference to improve technology instruction in State, Universities, and Colleges (SUCs) thus producing quality graduates who will meet the manpower needs of the job market. Many SUCs across the nation are experiencing rapid technological changes, continuous shifts in the learning environments, and a new generation of students exhibiting varied technology skills. This trend calls for current understanding of faculty technology integration practices. Further, evidence from this study could help SUCs to establish specific ways to strengthen the management and to decrease the occurrence of obstacles.

Instructors/Faculty. This study is an eye opener for them especially on the use of technology in their everyday instruction, i.e., that the success of their learners depends on their teachers’ expertise in integrating technology in the teaching-learning process.

Students. They are the ultimate beneficiaries of this study. What they get from their instructors now will redound to their preparedness for the world of work in the future.

Parents. Through this study they will be aware that technology is important for their children so they need to give them full support if they have to invest in their education.

Future Researches. This research may encourage them to do further researches on the importance of ICT/IT to improve the quality of life of everyone.

Scope and Limitations of the Study
This research is confined to the different State Universities and Colleges (SUCs) of the Autonomous Region in Muslim Mindanao for school year 2011-2012. The respondents were faculty and administrators of the said higher education institutions.

Thus, all the state, universities and colleges (Adiong Memorial Polytechnic State College, Basilan State College, Tawi-Tawi Regional Agricultural College, Sulu State College and Mindanao State University, Main Campus) from different provinces of the said region were the target respondents.

However, there are State Universities and Colleges which are not included like MSU-Maguindanao, MSU-Sulu and MSU-Tawi-Tawi considering that they satellite campuses of Mindanao State University, Marawi City.
Definition of Terms
For a clear and better understanding of this study, the following terms are either defined contextually/conceptually:

**Administrator.** In this study, it refers to all deans, and assistant deans of academic institutions.

**Budgeting.** In this study, it refers to the allocation of funding sources in technology integration into instruction including technology resources and professional development.

**Control.** It refers to the actual acquisition of the necessary resources and planning their integration in the classroom to meet the institutional goals.

Example of management control activities are the formulation of instructional objectives of a certain subject at a certain grade level when computers are introduced to teach and learn that subject, and the development of school-level budgets for resource acquisition and staff development (Cheever et. al, 1986).

**Faculty.** In this study, it refers to the entire teaching staff of a state university and college, including any administrator holding an academic rank.

**Integration.** In this study, it refers to the combination of parts and object that works together well.

**Instruction.** It refers on the process of facilitating the acquisition of knowledge and skills to develop the analytical and creative faculties of learners. It also includes other specific tasks, such as student consultation, academic advising, and all other initiatives that facilitate the process of learning (CHED Manual 2005).

**Management.** In this study, it describes the techniques and expertise of efficient and effective organization in the management strategies of integrating technology into instruction.

**Management Strategy.** In this study, it refers to planning, professional development, integrating technology, control and budgeting.

**Obstacles.** It refers to a pertaining to two kinds of conditions: material and non-material. The material conditions may be insufficient number of computers or copies of software. The non-material obstacles include teachers’ insufficient technology knowledge and skills, the difficulty of integrating technology into instruction, and insufficient teacher time (Pelgum, 2001).

**Planning.** It refers to the establishing institutional goals at district/state level, identifying the necessary resources to achieve goals, planning the acquisition, deployment and disposition of the resources. Examples of strategic planning activities are the writing of long term plan for the integration and use of computers in schools, and the appointment of citizens and committees to work towards funding acquisition (Cheever et. al, 1986).

**Technology Integration.** It refers to the use of technology tools in general content areas in education in order to allow students to apply computer and technology skills to learning and problem-solving. Generally speaking the curriculum/instruction drives the use of technology and not vice versa (Encarta Dictionaries).

**Technology.** It is the study; it refers to the development, and application of devices, machines, and techniques for manufacturing and productive processes in instruction like the use information Communication Technology (Electronic Encarta Dictionaries).

**RESEARCH METHODOLOGY**
This chapter discusses the research design, the respondents of the study, the research locale, the instruments used, the data gathering procedure, and the statistical tools utilized.

**Research Design**
The study employed the descriptive-correlation method of research which determined the management of integrating technology in instruction in State Universities and Colleges of the Autonomous Region in Muslim Mindanao (ARMM). Descriptive consists of methods for organizing, displaying, and describing data by using tables, histogram, charts, lines and summary measures in frequency, percentage and weighted mean.

However, Pearson correlation analysis is concerned with the relationship in the changes and movements of two variables and this has a computed value and may be visually illustrated through line charts in order to see the positive and negative correlation and the level of significance based on the formulated hypotheses and testing. Thus, t- test was utilized for the judgement as to whether apparent difference is true difference or to reject null hypotheses in the response or perception between administrators and faculty as respondents of the study. The rejection of null hypothesis both differences and relationship is based on the level of significance as a criterion.

**Respondents of the Study**
The respondents of this study were the administrators and faculty of the State Universities and Colleges (SUCs) of the Autonomous Region in Muslim Mindanao. All the administrators and faculty of Adiong Memorial Polytechnic State College (AMPSC), Tawi-Tawi Regional Agriculture College (TRAC), Basilan
State College (BSC), Sulu State College (SSC), and Mindanao State University, Marawi City (MSU) were considered the research population. The administrators are the deans and assistant deans of the SUCs.

Table 1. The respondents’ Population Distribution

<table>
<thead>
<tr>
<th>SUCs</th>
<th>POPULATION</th>
<th>SAMPLE</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ADMINISTRATOR</td>
<td>FACULTY</td>
<td>TOTAL</td>
</tr>
<tr>
<td>APMS</td>
<td>5</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>TRAC</td>
<td>6</td>
<td>73</td>
<td>79</td>
</tr>
<tr>
<td>BSC</td>
<td>5</td>
<td>77</td>
<td>83</td>
</tr>
<tr>
<td>SSC</td>
<td>6</td>
<td>85</td>
<td>91</td>
</tr>
<tr>
<td>MSU</td>
<td>28</td>
<td>539</td>
<td>567</td>
</tr>
<tr>
<td>TOTAL</td>
<td>50</td>
<td>794</td>
<td>845</td>
</tr>
</tbody>
</table>

Using Sloven’s Formula:
Standard Margin of Error: 0.050
Overall Margin of Error: 0.035
Faculty Margin of Error: 0.038
Administrators Margin of Error: 0.042

Figure 2. Sample Population of Administrators and Faculty

Table 1 shows the sampling of the respondents using Sloven’s formula. The total population of the administrators was 50 and only 46 administrators participated and the 370 faculty were also used as respondents with the standard margin of error of 0.038 for faculty and the overall margin of error is 0.035. the total number of respondents then is 416.

Locale of the Study
The study was conducted in the State Universities and Colleges of the different provinces of Autonomous Region in Muslim Mindanao.

State College is a state college in the Autonomous Region in Muslim Mindanao. It is mandated to provide higher technological, professional, and vocational instruction and training in science, agricultural and industrial fields, as well as short-term technical or vocational courses. It shall promote research, advance studies, and progressive leadership in its areas of specialization. Its main campus is located in Jolo, Sulu. Sulu State College is formerly DayangDayangHadjiPandao Memorial High School 1974.

Tawi-Tawi Regional Agricultural College is a public college in the Autonomous Region in Muslim Mindanao. It is mandated to provide professional, technical, and special training and promote research, extension services, and progressive leadership in the field of agriculture and home technology. Its main campus is located in Bongao, Tawi-Tawi. Tawi-Tawi Regional Agricultural College formerly Tawi-Tawi National Agricultural College 1957-1974.

Basilan State College is a state college in the island province of Basilan under the Autonomous Region in Muslim Mindanao. Its main campus is located in Isabela City with two college extension in Lamitan City and Maluso, Basilan, plus one agricultural and secondary campus in Sta. Clara.

Adiong Memorial Polytechnic State College is the youngest and the only polytechnic state college in the Autonomous Region in Muslim Mindanao. It is mandated to provide technologies in Agriculture, Forestry, Fisheries, Information Technology and other courses like education. It shall promote community sustainable development through research and extension.
It is located at the heart of the three municipalities: Bubong, BuapuposuBuntong and Ditisan Ramain, Lanao del Sur, Adiong Polytechnic State College was created under R.A. 1387 as amended though the authorship of Senator Domocao A. Alonto. The Mindanao State University was established in Marawi City on September 1, 1961. Dr. Antonio Isidro, former Vice President for Academic Affairs of the University of the Philippines, was the founder and first president of Mindanao State University. Formal classes opened in June, 1962 with 282 students, 19 faculty members and staff, and three core colleges: Community Development, Liberal Arts and Education.

After more than three decades of operation, the University has grown into a multi-campus University System with seventeen colleges and degree-granting units in the Marawi Campus alone. The University has also opened itself to the outside world through her cooperative linkages with major universities of Malaysia, Indonesia and Australia. When it comes to the educational dimension of the Brunei-Indonesia-Malaysia-Philippines East Asia Growth Area (BIMP-EAGA), MSU is among the leaders of the Philippine Universities. Thus, MSU has seven campuses located in Sulo, Tawi-Tawi, Buog, Naawan, Maguindanao, General Santos respectively. Other colleges operated by the government are also adopted and under the supervision of MSU like LNCAT, LNAC, MAIGO and others adjacent government colleges.

**Research Instrument and its Validity**

An open-ended survey through questionnaires were administered to the respondents of the study. This questionnaires was used as the main tool in gathering the data. The questionnaire and its format were restructured, and several items in the survey were revised for improved clarity. A pre-test study was conducted at Mindanao University of Science and Technology, Cagayan de Oro City in Region 10 which served as the respondents of the said pre-test for further validity of the questionnaire. Mindanao University of Science and Technology was a Polytechnic State College before it was converted to a University headed by Dr. Ricardo Rotoras, the current president of the Philippine Association of State Universities and Colleges (PASUC).

There were 38 faculty and 3 administrators who filled up the questionnaires. Based on the feedback obtained from the pre-test, it was found that one of the faculty respondents commented that the budgeting as management strategy should be addressed to the budget officer or administrators considering that the budget is not transparent to all constituents. The results were hand tabulated by the research to establish preliminary results, check the appropriateness of standard measures, determine potential areas of concern, and identify questions that would require further clarification. Generally, pre-test result was acceptable to be used in the final study.

**Data Gathering Procedure**

The procedures were formulated for smooth and organized administering of the distribution of questionnaires. Courtesy visit to the office of the Presidents of State Universities and Colleges (SUCs) of the Autonomous Region in Muslim Mindanao with the letter asking permission to utilize their faculty and administrators as respondents of the study was done before the distribution of the questionnaires. Picture taking was done for documentation purposes. All of the questionnaires were distributed first to the administrators then to their faculty with the attached letter signed by the researcher and noted by the adviser stating that their perceptions were treated confidentially. Thus, the questionnaires from different SUCs were tabulated and subjected to statistical analysis and interpretation.

**Statistical Tools Used**

The following statistical tools were utilized in this study:

1. The frequency and percentage distribution is used in the profile of the respondents and their responses in management strategies and obstacles occurrence in technology integration. It is an arrangement of the data which shows frequency of different values or groups of values of variables with the corresponding percentage using this formula.

**Formula:**

\[ \frac{n}{N} \times 100 \approx \% \]

2. The computation of the weighted means of the data is used in the management strategies as rated by the administrators and faculty. Weighted means are assigned to the observed values according the their relative importance using this formula:
3. Pearson-Moment Correlation Coefficient is used in measuring the relationship between variables like profile and management strategies, among management strategies and obstacles and management strategies. This is the most frequently encountered measure in terms of correlation using this formula:

\[ r = \frac{\sum X Y}{\sqrt{\sum X^2 \sum Y^2}} \]

Where:  
- \( r \) = correlation coefficient  
- \( X \) = independent variable  
- \( Y \) = dependent variable

**Level of Significance**  
<table>
<thead>
<tr>
<th>Degree of Significance</th>
</tr>
</thead>
</table>
| \( \leq 0.010 \) | Highly Significant  
| \( 0.011 - 0.050 \) | Significant  
| \( > 0.05 \) | Not Significant

**Correlation Coefficient**  
<table>
<thead>
<tr>
<th>Degree of Correlation</th>
</tr>
</thead>
</table>
| 0 | No correlation  
| 0.1 - 0.19 | Negligible  
| 0.2 - 0.39 | Low  
| 0.4 - 0.59 | Moderate  
| 0.6 - 0.79 | High  
| 0.8 - 1.00 | Very High

4. T-Test is used to find the difference between the faculty and administrators as raters on the management strategies in technology integration using this formula:

\[ t = \frac{x_1 - x_2}{s/\sqrt{n-1}} \]

Where:  
- \( t \) = t-value  
- \( x_1 \) = mean of 1st variables  
- \( x_2 \) = mean of the second variables  
- \( s \) = standard deviation  
- \( n \) = number of samples

5. The study formulated a rating scale as basis of interpreting the obtained weighted means of the variables. The interpretation of the results in terms of verbal description based on the following:

<table>
<thead>
<tr>
<th>Scale</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.54 – 5.00</td>
<td>Most Efficient and Effective</td>
</tr>
<tr>
<td>3.54 – 4.50</td>
<td>More Efficient and Effective</td>
</tr>
<tr>
<td>2.54 – 3.50</td>
<td>Efficient and Effective</td>
</tr>
<tr>
<td>1.54 – 2.50</td>
<td>Fairly Efficient and Effective</td>
</tr>
<tr>
<td>1.00 – 1.50</td>
<td>Inefficient and Ineffective</td>
</tr>
</tbody>
</table>

**The scale used in rating the Management Strategies in the Questionnaire**

<table>
<thead>
<tr>
<th>RATE</th>
<th>DESCRIPTION</th>
<th>EQUIVALENT</th>
<th>INTERPRETATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>FULLY IMPLEMENTED</td>
<td>100%</td>
<td>Contributed to the growth and development in the management of integrating technology into instruction</td>
</tr>
<tr>
<td>4</td>
<td>HIGHLY IMPLEMENTED</td>
<td>75%</td>
<td>Acquired expertise in the management of integrating technology into instruction</td>
</tr>
<tr>
<td>3</td>
<td>MODERATELY IMPLEMENTED</td>
<td>50%</td>
<td>Expanded flexibility in the management integrating technology into instruction</td>
</tr>
<tr>
<td>2</td>
<td>FAIRLY IMPLEMENTED</td>
<td>25%</td>
<td>Competent in the basic management of instructional technology</td>
</tr>
<tr>
<td>1</td>
<td>NOT IMPLEMENTED</td>
<td>0%</td>
<td>Development of survival management</td>
</tr>
</tbody>
</table>
PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA

This chapter presents the analysis and interpretation of the data gathered. It also discusses the reason for such results. The first part presents the profile of the faculty and administrators to the management strategies on integrating technology into instruction as perceived by the faculty and administrators. The fourth part looks into the relationship between the profile and management strategies, relationship among management strategies, relationship between obstacles occurrence and management strategies and the difference of the response or perception between administrators and faculty from the different State, Universities and Colleges of Autonomous Region in Muslim Mindanao.

Part I. Profile of the Respondents

The first part of the questionnaire was designed to gain indication of the 416 respondents, 46 faculty and 370 administrators (deans and assistant deans). The first section is about the information on their socio-demographic profile in terms of gender, marital status, educational attainment, academic rank, length of service and teaching load.

Gender

Table 2 Frequency and Percentage Distribution of the respondents in SUC-ARMM according to Gender

<table>
<thead>
<tr>
<th>GENDER</th>
<th>FREQUENCY</th>
<th>PERCENTAGE</th>
<th>CUMULATIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>269</td>
<td>64.7</td>
<td>64.7</td>
</tr>
<tr>
<td>Male</td>
<td>147</td>
<td>35.3</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>416</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

![Figure 3. Gender Frequency and Percentage Distribution](image)

Table 2 shows that majority (269 or 64.7 percent) of the respondents are female, while many (147 or 35.3 percent) are male. In 1987, a study of 64 of the 78 State Colleges and Universities in the Philippines showed that of the 10,546 faculty members, 57 percent were women and 43 percent were men (Manzolin, 1987). This is consistent in the study conducted by Gacayan (2002) on the Perception of Cooperating Teachers on the Institutional Competencies of Student Teachers, the cooperating teachers who served as respondents consisted of 69 percent female and only 31 percent male. This indicates that teaching profession is dominated by females.
Marital Status

Table 3 Frequency and Percentage Distribution of the respondents in SUC-ARMM according to Civil Status

<table>
<thead>
<tr>
<th>CIVIL STATUS</th>
<th>FREQUENCY</th>
<th>PERCENTAGE</th>
<th>CUMULATIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>100</td>
<td>24.0</td>
<td>24.0</td>
</tr>
<tr>
<td>Widow/Separated</td>
<td>37</td>
<td>8.9</td>
<td>32.9</td>
</tr>
<tr>
<td>Married</td>
<td>147</td>
<td>67.1</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>416</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Table 3 reveals that the majority (147 or 67.1 percent) of the respondents are married. Several (100 or 24.0 percent) are single and only a few (37 or 8.9 percent) are widows and separated.

Based on the study of Hung Wai (1994), married teachers tend to have higher pedagogical, personal and administrative self-concept than single teachers. As observed, people when married may have adjustment in their social life which increase their social obligations especially for the people of Autonomous Region in Muslim Mindanao.

Educational Attainment

As shown in Table 4, many (159 or 38.2 percent) out of 416 respondents are Master’s degree holder. Many (139 or 33.4 percent) are Baccalaureate graduates, several (81 or 19.5 percent) have a doctorate degree and a few (35 or 8.9 percent) have doctoral units.

Pursuant to the University/College merit system for faculty members, the minimum educational qualification for recruitment shall be a master’s degree or its equivalent in the appropriate specific area of specialization. In the absence of one qualified shall be temporary until such time the person concerned has acquired the requisite qualification within a period of not more than two (2) years (CHED Manual 2005). Moreover, the results reveal that the faculty in State, Universities and Colleges are competent enough in terms of educational attainment.

Table 4. Frequency and Percentage Distribution of the Respondents in SUC-ARMM according to Educational Attainment

<table>
<thead>
<tr>
<th>EDUCATIONAL ATTAINMENT</th>
<th>FREQUENCY</th>
<th>PERCENTAGE</th>
<th>CUMULATIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>BS/AB</td>
<td>139</td>
<td>33.4</td>
<td>33.4</td>
</tr>
<tr>
<td>MS/MA</td>
<td>159</td>
<td>38.2</td>
<td>71.6</td>
</tr>
<tr>
<td>Ph.D./Ed.D. units</td>
<td>37</td>
<td>8.9</td>
<td>80.5</td>
</tr>
<tr>
<td>Ph.D./Ed.D.</td>
<td>81</td>
<td>19.5</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>416</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>
Figure 5. Educational Attainment Frequency and Percentage Distribution

Academic Rank

Table 5. Frequency and Percentage Distribution of the Respondents in SUC-ARMM according to Academic Rank

<table>
<thead>
<tr>
<th>ACADEMIC RANK</th>
<th>FREQUENCY</th>
<th>PERCENTAGE</th>
<th>CUMULATIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructor</td>
<td>157</td>
<td>37.74</td>
<td>37.74</td>
</tr>
<tr>
<td>Asst. Professor</td>
<td>121</td>
<td>29.08</td>
<td>66.82</td>
</tr>
<tr>
<td>Associate Professor</td>
<td>63</td>
<td>15.14</td>
<td>81.96</td>
</tr>
<tr>
<td>Professor</td>
<td>75</td>
<td>18.04</td>
<td>100.00</td>
</tr>
<tr>
<td>Total</td>
<td>416</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Figure 6. Academic Rank Frequency and Percentage Distribution

It can be deduced in Table 5 that majority (243 or 58.4 percent) are Instructors in terms of academic rank. Several (159 or 20.4 percent) are Assistant Professor, few (81 or 12.7 percent) are Professors and very few (37 or 8.4 percent) are Associate Professors.

Being in the academe today can be truly satisfying, that is, if you find yourself in the higher ranks as these are associated with higher pay. A faculty can be promoted by satisfying the requirements of a higher position as stipulated in National Budget Circular 461, a position classification and compensation scheme for faculty positions in state universities and colleges.

This will require competence in the areas of instruction, research, extension and production as a required function of a faculty member. Points should be earned along these four key areas. (Philippine Teaching Profession).
Thus, the finding indicates that the promotion of the faculty in SUC-ARMM is limited and subject for the availability of funds.

**Length of Service**
Table 6 reveals that among the 416 respondents, most (115 or 27.6 percent) have been teaching between 1-5 years; (82 or 19.7 percent) between 6-10 years; (74 or 17.8 percent) between 11-15 years; (42 or 10.1 percent) between 16-20 years; (40 or 9.6 percent) between 21-25 years; and (16 and 14 or 3.8 and 3.1 percent) between 21-25 years and above 35 years respectively.

<table>
<thead>
<tr>
<th>EDUCATIONAL ATTAINMENT</th>
<th>FREQUENCY</th>
<th>PERCENTAGE</th>
<th>CUMULATIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-5 years</td>
<td>115</td>
<td>27.6</td>
<td>27.6</td>
</tr>
<tr>
<td>6-10 years</td>
<td>74</td>
<td>17.8</td>
<td>45.4</td>
</tr>
<tr>
<td>11-15 years</td>
<td>82</td>
<td>19.7</td>
<td>65.1</td>
</tr>
<tr>
<td>16-20 years</td>
<td>42</td>
<td>10.1</td>
<td>75.2</td>
</tr>
<tr>
<td>21-25 years</td>
<td>16</td>
<td>3.8</td>
<td>79.1</td>
</tr>
<tr>
<td>26-30 years</td>
<td>34</td>
<td>8.2</td>
<td>87.3</td>
</tr>
<tr>
<td>31-35 years</td>
<td>40</td>
<td>9.6</td>
<td>96.9</td>
</tr>
<tr>
<td>Above 35 years</td>
<td>13</td>
<td>3.1</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>416</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 7.** Length of Service Frequency and Percentage Distribution

These means that these SUC faculty members are relatively young in the service. In addition, most of them, more than 27.6 percent, have been serving as faculty for even a short period – 1 to 5 years. However, in the cumulative percentage faculty from 1-15 years obtained 65.1 percent. As observed, instructors with 1-5 years length in service are spending most of their time in classroom and office and willing to accepts multi tasking.

**Teaching Load**
Table 7 shows that most (117 or 28.1 percent) of the respondents have 19-21 units of teaching load; (77 or 18.5 percent) have 16-18 units; and (61 or 14.7 percent) have 22-24 units. Very few (9 or 2.2 percent) have 1-3 units only.

Regular faculty members should serve a minimum of twenty-five (25) hours per week distributed from Monday to Saturday depending on their assigned teaching load Regular Faculty Members should serve a minimum of twenty-five (25) hours per week spread from Monday to Saturday depending on their assigned number of loads. Teaching loads refer to handling a subject and providing classroom instructions to students. A full time faculty member, renders a minimum of twenty-five (25) hours of service per week; fifteen (15) hours of teaching and ten (10) hours of preparation. The ten (10) hours of preparation include lesson planning and academic advising. Thus, the regular load for a full time faculty in State Universities and Colleges is 18 units and 3 or 6 units for the dean and assistant deans respectively (CHED Manual 2005).
The result revealed that the faculty of SUC-ARMM has overload units due to the limited number of faculty and unavailability of additional itemized faculty. Thus, the Department of Budget and Management decreases the budget allocation to all SUCs every year and the budget for personal services is intended for the faculty listed in the plantilla.

Part II. Management Strategies in Integrating Technology

The second problem focused on the faculty and administrators’ response with regards to the implementation of integrating technology in instruction in State Universities and Colleges of the Autonomous Region in Muslim Mindanao in terms of planning, integrating technology, professional development, control and budgeting.

The respondents’ Weighted Mean Ratings in the Management Strategies

Table 8 presents the summary of the respondents’ weighted mean ratings on the five management strategies in integrating technology in instruction. As rated by faculty and administrators, all the responses are moderately efficient and effective in terms of planning, integrating technology, professional development, control and budgeting based on the weighted mean. The overall mean is 3.041 interpreted as moderately efficient and effective. This means that the implementation of integrating technology in instruction is not expanded and flexible in the management at State Universities and Colleges (SUCs). This problem could be due to limited resources and outdated network and poor connectivity. Based on the questionnaire administered, only the Mindanao State University has a website and uses data system campus wide.
Table 8. Summary of the Mean Rating of the Respondents in the Management of Integrating Technology in Instruction

<table>
<thead>
<tr>
<th>Management Strategies</th>
<th>Administrators Weighted Mean</th>
<th>Faculty Weighted Mean</th>
<th>Faculty and Administrators Weighted Mean</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning</td>
<td>3.165</td>
<td>3.068</td>
<td>3.116</td>
<td>Moderately Efficient and Effective</td>
</tr>
<tr>
<td>Integrating</td>
<td>3.150</td>
<td>3.075</td>
<td>3.112</td>
<td>Moderately Efficient and Effective</td>
</tr>
<tr>
<td>Professional Development</td>
<td>3.141</td>
<td>2.999</td>
<td>3.070</td>
<td>Moderately Efficient and Effective</td>
</tr>
<tr>
<td>Control</td>
<td>3.102</td>
<td>3.000</td>
<td>3.051</td>
<td>Moderately Efficient and Effective</td>
</tr>
<tr>
<td>Budgeting</td>
<td>2.878</td>
<td>2.834</td>
<td>2.856</td>
<td>Moderately Efficient and Effective</td>
</tr>
<tr>
<td>Overall Management</td>
<td>3.087</td>
<td>2.995</td>
<td>3.041</td>
<td>Moderately Efficient and Effective</td>
</tr>
</tbody>
</table>

This implies that school management needs to know how to align technology strategies with school development (Loudon and Loudon, 2002). Schools have different missions and operations as compared to corporations. These differences in mission, operations and culture call for our attention to investigate the model, benchmarks, best practices, or other issues on how schools should manage information technology. According to Friedman (1994), proper management of technology integration in schools is important. Thus, public institutions are hierarchical by design. They were not structured to be work place demo.

On the other hand, Levine (1998) and Cheever et al. (1986) thus inform us how essential it is to plan at different levels based on real needs in order to increase the probability of getting the acceptance and support of all other stakeholders both philosophically and financially. Therefore, technology integration requires the preparation, implementation and evaluation of holistic plans at various levels – the classroom, school, district, state, and across the nation. It is important to ensure that these plans do not conflict with or diverge from each other. Rather, they should be compatible, integrative and synergistic.

According to Miller (1988) school administrators should encourage teachers to develop a positive attitude about computers and to have minimum skills in using computers for educational purposes. Administrators should be conducted so that teachers do not feel threatened in any way due to the introduction of technology in the classroom and such that they learn to appreciate the virtues of technology in education. They should be given positive accounts of how technology can make their teaching duties easier and more pleasing. Also, they should feel secure from the fear of job loss due to the integration of technology. They should be reassured that their job will not be threatened in any way by technology, and that technology will rather complement their classroom instruction.

Management Strategies as Rated by the Respondents
Table 9 reveals the responses of the respondents in their management strategies.
In terms of planning, there were (205 or 49.3 percent); integrating technology (207 or 49.8 percent); professional development (203 or 48.8 percent); control (207 or 49.9 percent); and budgeting (194 or 46.6 percent); all interpreted as “moderately implement”.

The result agreed that modern technology offers many means of improving teaching and learning in the classroom (Lefebvre, Deudelin&Loiselle, 2006). Similarly, Dawes (2001) is of view that new technologies have the potential to support education across the curriculum and provide opportunities for effective communication between teachers and students in a ways that have not been possible before. Consequently technology integration gives support that technology can be used to transform classrooms and change how teachers teach. However, as noted by Knapp and Glenn (1996) much of this research deals with classrooms in technology rich environments. As Hess (1999) states, regarding research on technology integration, “Educational research tends to focus on those schools that are islands of exceptional effectiveness in a sea of chaos” (p. 157).

Table 9. Frequency and Percentage Distribution of the Management Strategies as Rated By the Respondents

<table>
<thead>
<tr>
<th>MANAGEMENT STRATEGIES</th>
<th>Rating</th>
<th>Planning</th>
<th>Integrating</th>
<th>Prof. Devt.</th>
<th>Control</th>
<th>Budgeting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Freq.  %</td>
<td>Freq.  %</td>
<td>Freq.  %</td>
<td>Freq.  %</td>
<td>Freq.  %</td>
<td>Freq.  %</td>
</tr>
<tr>
<td>Not Implemented</td>
<td>13</td>
<td>3.1</td>
<td>16</td>
<td>3.8</td>
<td>20</td>
<td>4.8</td>
</tr>
<tr>
<td>Fairly Implemented</td>
<td>88</td>
<td>21.2</td>
<td>79</td>
<td>19.0</td>
<td>96</td>
<td>23.1</td>
</tr>
<tr>
<td>Moderately Implemented</td>
<td>205</td>
<td>49.3</td>
<td>207</td>
<td>49.8</td>
<td>203</td>
<td>48.8</td>
</tr>
<tr>
<td>High Implemented</td>
<td>94</td>
<td>22.6</td>
<td>94</td>
<td>22.6</td>
<td>78</td>
<td>18.8</td>
</tr>
<tr>
<td>Fully Implemented</td>
<td>16</td>
<td>3.8</td>
<td>20</td>
<td>4.8</td>
<td>19</td>
<td>4.6</td>
</tr>
<tr>
<td>Total</td>
<td>416</td>
<td>100.0</td>
<td>416</td>
<td>100.0</td>
<td>416</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Figure 9. Management on Integrating Technology Frequency and Percentage Distribution

These results affirm that management of technology integration should be part of the school management. Altaran and Van Laar (2001) used the school management or principal perspective to consider how schools can manage technology. As Drucker (1999) pointed out, the most valuable asset of a 21st century institution, whether business or non-business, will be its knowledge of the workers and their productivity. Education, as central to a knowledge society must produce people who are able to create and gain advantages from the new knowledge (Bereiter, 2002).

As cited by Bennet (1996), if technology is to be integrated in the school curriculum, the meaning of educational leadership and the role of administrators in technological change must be redefined. Kearsley and Lynch (1992) believe that cultural view of leadership is most useful in discussion of technology integration in education, in which leaders are expected to shape the culture of an individual school by creating new visions that organizational members can believe in and act upon. Then, what consideration must be made to effectively plan and implement technology integration in school?

Bennet (1996) argues that the cultural and physical environment within a school is an important factor to be considered in technology integration. Lanagan and Jacobsen (2003) provide a contextual framework with which school principals or administrators can undertake new responsibilities and roles as technology leaders, including leaders of learning, leaders of student entitlement, leaders of capacity building, leaders of community, and leaders of resource management. As
fullan (1999) noted, it will always fail until we find some ways of developing infrastructures and processes that engage teachers in developing new understanding, and deep meaning about new approaches to teaching and learning. While new technologies can help teachers enhance their pedagogical practice, they can also assists students in their learning.

According to Grabe and Grabe (2007), technologies can play a role in students skills, motivation, and knowledge. In addition, Becta (2003), recommended five factors influence the likelihood that good technology learning opportunities will develop schools: Technology resourcing, technology leadership, school leadership, and general teaching. Becta (2003) also indicated that the success of integration of new technology into education varies from curriculum to curriculum, place to place, and class to class depending on the ways in which it is applied. Thus, new technologies may also help to increase student motivation (Osborne & Collins, 2000), facilitate clearer thinking, and develop interpretation skills with data (Newton and Rogers, 2003).

The Obstacles in Integrating Technology in Instruction

This section presents the problems or obstacles in integrating technology in instruction. All the possible problems are ranked as perceived by the faculty and administrators of SUC of the Autonomous Region in Muslim Mindanao.

Obstacles as Ranked by the Faculty and Administrators

Based on Table 10, the data revealed that the problems/obstacles in integrating technology in instruction as perceived by the respondents are ranked according to the following: the first (16.4%) problem/obstacles is power interruption and fluctuation which cause damages. The second (15.4%) is outdated Network and poor internet connectivity. The third (11.2%) is limited computers and technology available. Fourth (10.1%) is a lack of maintenance or repair and upgrading software while the fifth (9.0%) is lack of supervisor and technical assistance; the seventh (8.8%) is inadequate school space or classroom for ready technology; followed by (8.7%) which is limited access to technology resources; (7.5%) insufficient training opportunities for faculty/administrators and the last (4.0%) is lack of faculty/administrators’ competence in the use of technology.

Due to technologies importance in society and possibly in the future of education, identifying the possible obstacles to the integration of these technologies is school would be an important step in improving the quality of teaching and learning. Balanskat, Blamire, and Kefala (2006) argue that although educators appear to acknowledge the value of technology in schools, difficulties continue to be encountered during the process of adopting these technologies.

Some obstacles/problems to adequate technological education are evident, especially in the case of all ARMM areas that power interruption and fluctuation which cause damages to the technology resources, it is linked with other obstacles like, outdated and poor/no internet connectivity, limited access, lack of maintenance and repair, and insufficient time available. Access to resources was another factor identified in current research literature.

Table 10. The respondents’ Rank and Percentage Ratings of the Obstacles Perceived in Integrating Technology in Instruction

<table>
<thead>
<tr>
<th>Problems/Obstacles</th>
<th>FACULTY</th>
<th></th>
<th>ADMINISTRATORS</th>
<th></th>
<th>FACULTY AND ADMINISTRATORS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited Computers and Technology Available</td>
<td>3</td>
<td>11.7</td>
<td>4</td>
<td>10.0</td>
<td>3</td>
<td>11.2</td>
</tr>
<tr>
<td>Lack of Faculty/Administrators Competence in the use of Technology</td>
<td>10</td>
<td>3.5</td>
<td>10</td>
<td>5.7</td>
<td>10</td>
<td>4.0</td>
</tr>
<tr>
<td>Lack of Maintenance or the repair and upgrading software</td>
<td>4</td>
<td>10.9</td>
<td>5</td>
<td>8.6</td>
<td>4</td>
<td>10.1</td>
</tr>
<tr>
<td>Limited Access to Technology Resources</td>
<td>8</td>
<td>8.7</td>
<td>7</td>
<td>7.1</td>
<td>8</td>
<td>8.7</td>
</tr>
<tr>
<td>Insufficient time available in the use of technology</td>
<td>5</td>
<td>9.3</td>
<td>9</td>
<td>5.7</td>
<td>6</td>
<td>8.8</td>
</tr>
<tr>
<td>Lack of Supervisor and Technical Assistance</td>
<td>6</td>
<td>9.1</td>
<td>6</td>
<td>7.1</td>
<td>5</td>
<td>9.0</td>
</tr>
<tr>
<td>Outdated Network and Poor Connectivity</td>
<td>2</td>
<td>14.8</td>
<td>8</td>
<td>7.1</td>
<td>2</td>
<td>15.4</td>
</tr>
<tr>
<td>Insufficient Training Opportunities for Faculty/Administrators</td>
<td>9</td>
<td>7.6</td>
<td>2</td>
<td>17.1</td>
<td>9</td>
<td>7.5</td>
</tr>
<tr>
<td>Inadequate School Space for Ready Technology Classroom</td>
<td>7</td>
<td>9.1</td>
<td>3</td>
<td>11.4</td>
<td>7</td>
<td>8.8</td>
</tr>
<tr>
<td>Power Interruption and Fluctuation which cause damages</td>
<td>1</td>
<td>15.3</td>
<td>1</td>
<td>20.00</td>
<td>1</td>
<td>16.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100.0</strong></td>
<td></td>
<td><strong>100.0</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Sufficient technology infrastructure must be made available for successful technology use (Becker & Ravitz, 1999). This includes access to resources as a function of both teacher training (Doering, Hughes & Huffman, 2003; Mouza, 2003) and classroom use (Butzin, 2001). It is interesting to note that access in these studies was typically mentioned in the discussion and was not a major finding of most of these studies. In Sicilia’s study (2005), teachers complained about how difficult it was to always have access to computers. The author gave reasons like “computers had to be booked in advance and the teachers would forget to do so, or they could book them for several projects with the students. In other words, teacher would have no access to technology materials because most these were shared with other teacher.

According to Becta (2004), the inaccessibility of technology resources is not always merely due to non-availability of the hardware and software or other technology materials within the school. It may be result of one of a number of factors such as poor organizations of resources, poor quality hardware, inappropriate software, or lack of personal access for teachers (Becta, 2004). Similarly, Alwani (2005) found that having no access to the internet during school day and lack of hardware were impeding technology integration in Saudi Schools. Recent research of Albini (2006), indicated that insufficient computer resources were one of the greatest impediments of technology integration in the attitudes towards the use if technologies is their understanding of how those technologies will benefit their teaching and their students’ learning. In addition, Schoepp’s study (2005) found that, although teachers felt that there was more than enough technology available they did not believe that they were being supported, guided or rewarded in the integration of technology into their teaching.

**Obstacles as Ranked by the State Universities and Colleges**

Table 11 shows that the problems/obstacles of Adiong Memorial Polytechnic State College are ranked accordingly. The first (29.3%) problems power interruption and fluctuation which cause damages; followed by (19.5%) outdated Network and Poor Internet Connectivity followed by (9.8%) which is insufficient time available in the use of technology; next is (7.3%) limited computers and technology, lack of supervisor and technical assistance and inadequate school space or classroom for ready technology. The last (4.9%) is lack of maintenance or repair and upgrading software; insufficient time available in and the use of technology; limited access to technology; insufficient training opportunities for faculty/administrators; and lack of faculty/administrators’ competence in the use of technology. Tawi-Tawi Regional Agricultural College Ranked its problems such as (20.6%) outdated network and poor internet connectivity; and (14.7%) lack of faculty/administrators’ competence in the use of technology. Moreover, the third (11.8%) is power interruption and fluctuation which cause damages and inadequate school space or classroom for ready technology; (8.8%) is insufficient training opportunities for faculty/administrators; (5.9%) is insufficient time available in the use of technology; and limited access to technology resources; and (2.9%) lack of maintenance or repair and upgrading software; and limited computers and technology available.
In Basilan State College the ranking of problems/obstacles are as follow: The first (17.8%) is power interruption and fluctuation which cause damages; followed by (12.8%) insufficient time available in the use of technology; outdated network and poor internet connectivity; limited computers and technology available and limited access to technology resource. It is followed by (8.5%) lack of supervisor and technical assistance and inadequate school space or classroom for ready technology; then (6.4%) lack of maintenance or repair and upgrading software and (4.3%) lack of faculty/administrators’ competence in the use of technology; and insufficient training opportunities for faculty/administrators.
The problems/obstacles in integrating technology in instruction as perceived by the state college are ranked according to the following: The first (15.4%) is outdated network and poor internet connectivity and limited computers and technology available, followed by (13.5%) insufficient time available in the use of technology; (11.5%) lack of maintenance for repair and upgrading software; (9.6%) limited access to technology resources; (7.7%) lack of supervisor and technical assistance, inadequate school space or classroom for ready technology, and power interruption and fluctuation which cause damages; and the last (5.8%) insufficient training opportunities for faculty/administrators and lack of faculty/administrators’ competence in the use of technology.

Mindanao State University, Main Campus, the problems/obstacles are ranked based on the following: The first (16.5%) is power interruption and fluctuation which cause damages; followed by (14.9%) outdated network and poor internet connectivity; (11.6%) limited computers and technology available; (11.4%) lack of maintenance or repair and upgrading software; (8.9%) lack of supervisor and technical assistance and lack of school space or classroom for ready technology; (8.7%) limited access to technology resources; then (8.5%) insufficient time available in the use of technology; (7.8%) insufficient training opportunities for faculty/administrators and the last (2.9%) lack of faculty/administrators’ competence in the use of technology.

Generally, public institutions are hierarchical by design. They were not structured to be work place democracies that function to serve teachers or their union representatives. It is not within the role teachers to shape policy or control school. Teachers are not entitled the role teachers to vote on decisions about school procedures curriculum issues, or vacation schedule (Owens, 2001). No reasonable school administrator would ignore teachers or deny them a voice in school matters, but to extend leadership authority to teachers would be to distort school authority and the ends for which schools were established. In public education, the state has given school administrators the authority to run schools and provide constitutionally mandated instruction. Good management principles demand that, in large organizations, one persons or one small group of people outcomes and to be accountable. One recent report, while highly critical of education of school administrators, recognizes the complexity of task assigned to school administrators.

Arthur Levine (2005), the president of Teachers College, Columbia University, writes, that school administrators no longer serve as supervisor. They are being called on to lead and redesign of theirs schools and systems. In an outcome-based and accountability-driven era, administrators have to lead their schools in rethinking goals, priorities, finances, staffing, curriculum, pedagogies, learning resources, assessment methods, technology and the use of time and space.

According to Hoy and Hoy (2003), one of the key roles for any administrators is to transform and inspire the efforts of teachers. Good schools could not exist without good teachers. Good teachers, have a demonstrative impact on learning that takes place in their classrooms, but at the school level, the evidence is convincing the student learning is strongly influenced who can encourage learning, support and reward good teaching, and ensure schools serve the community. In discussing leadership and planning of SUCs, Byrom and Bingham (2001) point out that leadership may be the single most important factor in the success of integrating technology into the classroom. This often includes comprehensive planning for technology. In schools that do not have a leadership that has positive expectations for compute use or that do not in still or support a culture of technology use, integration is inhibited (Dexter, Anderson & Becker, 1999; Parr, 1999). Leadership that can plan and implement whole district or whole school approaches to integration enhances both the use and integration of technology (Prain & Hand, 2003). Of the studies selected only one mentioned funding as a factor. Byrom and Bingham (2001) noted that economically disadvantaged schools have greater barriers than their affluent counterparts. For these disadvantaged schools funding becomes an issue that inhibits integration of technology.

To better understand the integration of technology into instruction, some authors have approached the topic from change management and diffusion of innovation perspectives. Rather than introduction new technologies, Kershaw (1996) believes successful technology integration focuses on managing innovation model developed by E. M. Rogers (1995) to understand faculty reaction to a development program on technology integration.

The act of integrating technology into teaching and learning is a complex process and one that may encounter a number of difficulties. This difficulties are known as barriers (Schoepp, 2005). A barrier is defined as any condition that cited by Schoepp, 2005).

Another perspective presents the obstacles pertaining to two kinds of conditions: material and non-material (Pelgum, 2001). The material conditions may be insufficient number of computers or copies of software. The non-material obstacles include teachers’ insufficient technology knowledge and skills, the difficulty of integrating technology into instruction, and insufficient teacher time. Adams (2002) also studied technology integration from a change perspective using the Concerns Based Adoption Model (CBAM).
developed by Hall, Wallace and Dossett (1973). She found that faculty who had higher levels of technology integration had higher-level concerns about technology integration. Also, faculty with higher participation in technology training and development had higher-level concerns.

The Relationship of Variables
This section presents and analyses whether there exists a relationship between the respondents’ profile and the management strategies, problems/obstacles and management. It also shows whether there is a significant difference between the respondents and their management of integration of technology in instruction.

Relationship between Management Strategies and Respondents’ Profile

Table 12 presents the relationship between the respondents’ profile and the management strategies and respondent’s profile. It is observed that there is a significant relationship between academic rank and professional development. This implies that professional development affects the academic rank of the faculty.

In addition, the promotion of the faculty and administrators are based on professional development. Educational Attainment and Control has a significant relationship in a way that the educational attainment of the faculty and administrators will be the level of control in the management. This follows that the faculty and administrators with high educational attainment are good managers that greatly affects the control of the management.

Table 12. Summary of the Significant Relationship between Management Strategies And the Respondents’ Profile

<table>
<thead>
<tr>
<th>PROFILE</th>
<th>PLANNING</th>
<th>Integrating Technology</th>
<th>Personality Development</th>
<th>Control</th>
<th>Budgeting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CC</td>
<td>LS</td>
<td>CC</td>
<td>LS</td>
<td>CC</td>
</tr>
<tr>
<td>Gender</td>
<td>-0.039</td>
<td>0.215</td>
<td>-0.31</td>
<td>0.266</td>
<td>-0.011</td>
</tr>
<tr>
<td>Marital Status</td>
<td>0.066</td>
<td>0.90</td>
<td>0.066</td>
<td>0.088</td>
<td>0.035</td>
</tr>
<tr>
<td>Educational Attainment</td>
<td>0.045</td>
<td>0.180</td>
<td>0.036</td>
<td>0.234</td>
<td>0.035</td>
</tr>
<tr>
<td>Academic Rank</td>
<td>0.034</td>
<td>0.245</td>
<td>0.068</td>
<td>0.082</td>
<td>0.035</td>
</tr>
<tr>
<td>Length in Service</td>
<td>0.033</td>
<td>0.254</td>
<td>0.023</td>
<td>0.319</td>
<td>0.040</td>
</tr>
<tr>
<td>Teaching Load</td>
<td>0.004</td>
<td>0.467</td>
<td>-0.001</td>
<td>0.493</td>
<td>0.002</td>
</tr>
</tbody>
</table>

Legend: CC : Correlation Coefficient
          LS : Level of Significance
          : Significant

Figure 13. Relationship between Profile and Management

As cited by Hall (1997), teacher development is extremely significant as knowledge use and teacher development is inextricably linked to curriculum development and change, whether it be through the development of curriculum materials and instructional practices. However, professional development
opportunities for the administrators are equally important and need to be addressed in the future. In other words, professional development in information technology has been provided in a range format, which is designed to suit the different learning styles of educator. Schools and school systems have struggled to keep up with the cost of technology integration and sometimes have rushed to purchase hardware and software without sufficient planning.

In most cases, professional development for teachers integrating technology is an afterthought and is considered an add-on at a later date. Unfortunately if it is not planned for, professional development will not get the attention it needs. School systems are slowly starting to realize that money spent on school technology is wasted without a proportional effort to help teachers with its use and integration into the curriculum Zehr (cited in Earle, 2002, p. 24). This attitude needs to change and decision makers need to stop thinking about technology first and then education later.

For example, according to Weiner (cited in Shibley, 2001, p 61) in the U.S. in 1999-2000, 5.6 billion dollars was spent on technology and only 17% was on training. In most states the amount is typically around 5% and therefore this figure seemed high. When asked to supply figures associated with technology integration, 50% of the states that were asked to provide figures for teacher training could not. Teachers typically feel that they need more time to effectively integrate technology into the curriculum. As a general rule, successful school systems are using approximately one-third of their technology funding for teacher development. If teacher development is funded in this manner then what Beavers (2001) says become possible.

**Relationship between Obstacles and Management Strategies**

It is shows in Table 13 that the correlation results between the problems/obstacles and management strategies as rated by the respondents is highly significant in all variables such as planning, integrating technology, professional development, control, budgeting. This means that if the management of integrating technology is efficient and effective, the more reduction of the problems/obstacles.

In the last ten years, the uptake of technologies has been patchy. In some schools, information technologies have become central in teaching and learning activities and administrative functions, while in other schools there appears to have been only limited interest in adopting new technologies for these purposes (Baggott La Velle, McFarlane and Brawn, 2003).

To account for this, evaluation in schools have pointed to various materials (Insufficient number of computers and lack of software) and immaterial (difficulty of integration into instruction and insufficient time) problems/obstacles to the adoption of technology, and provided various recommendations (basic training for teachers and improved computer student ratio) about the ways in which greater use of information technology in schools could be promoted (Pelgrum, 2001).

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>CORRELATION COEFFICIENT</th>
<th>DEGREE OF CORRELATION</th>
<th>LEVEL OF SIGNIFICANCE</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning</td>
<td>-0.197</td>
<td>Negligible</td>
<td>0.000</td>
<td>Highly significant</td>
</tr>
<tr>
<td>Integrating</td>
<td>-0.149</td>
<td>Negligible</td>
<td>0.000</td>
<td>Highly significant</td>
</tr>
<tr>
<td>Professional Development</td>
<td>-0.214</td>
<td>Low</td>
<td>0.000</td>
<td>Highly significant</td>
</tr>
<tr>
<td>Control</td>
<td>-0.228</td>
<td>Low</td>
<td>0.000</td>
<td>Highly significant</td>
</tr>
<tr>
<td>Budgeting</td>
<td>-0.247</td>
<td>Low</td>
<td>0.000</td>
<td>Highly significant</td>
</tr>
</tbody>
</table>
Tubin et al., (2003) have shown that, in the right conditions, technology can have a major impact on teaching/learning activities in schools. Based on the literature and practitioner experience, Leggett & Persichitte (1998) identify five categories of barriers to technology integration: time, expertise, access, resources, and support. P. L. Rogers (2000) identifies similar barriers and develops a model for visualizing the relationships among these barriers. In this model, stakeholder attitudes and perceptions towards technology, its use in education, and institutional support determine what will be considered.

Relationship Among Management Strategies

The correlation results as shown in Table 14 between and among management strategies are highly significant in all variables with high degree of correlation. These finding indicate that the variables or the management strategies are interrelated and cannot be treated individually. These strategies should be addressed as one, such that the failure of one leads to the failure of others. As an example, if planning is not good, all the variables such as integrating, professional development, control and budgeting will be affected.

As Fullan (1991, p. 315) says that “continuous development of all teachers is the cornerstone for meaning, improvement and reform. Professional development and school development are inextricably linked.” He also argues that “The theory of change that we have been evolving clearly points to the importance of peer relationship within the school. Change involves learning to do something new, and interaction is the primary basis for social learning. New meanings, new behaviors, new skills and new beliefs depend significantly on whether teachers working as isolated or are exchanging ideas, support and positive feelings about their work” (Fullan, 1991 p. 77).

### Table 14. Summary of the Correlation Results between and among Management Strategies by the Respondents

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>CORRELATION COEFFICIENT</th>
<th>DEGREE OF CORRELATION</th>
<th>LEVEL OF SIGNIFICANCE</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning vs. Int.</td>
<td>0.812</td>
<td>Very high</td>
<td>0.000</td>
<td>Highly</td>
</tr>
<tr>
<td>Planning vs. Prof. D.</td>
<td>0.759</td>
<td>High</td>
<td>0.000</td>
<td>Significant</td>
</tr>
<tr>
<td>Planning vs. Control</td>
<td>0.805</td>
<td>Very high</td>
<td>0.000</td>
<td>Highly</td>
</tr>
<tr>
<td>Planning vs. Budgeting</td>
<td>0.704</td>
<td>High</td>
<td>0.000</td>
<td>Significant</td>
</tr>
<tr>
<td>Integrating vs. Prof. D.</td>
<td>0.780</td>
<td>High</td>
<td>0.000</td>
<td>Highly</td>
</tr>
<tr>
<td>Integrating vs. Control</td>
<td>0.780</td>
<td>High</td>
<td>0.000</td>
<td>Significant</td>
</tr>
<tr>
<td>Integrating vs. Budgeting</td>
<td>0.698</td>
<td>High</td>
<td>0.000</td>
<td>Highly</td>
</tr>
<tr>
<td>Prof. D. vs. Control</td>
<td>0.871</td>
<td>Very high</td>
<td>0.000</td>
<td>Highly</td>
</tr>
<tr>
<td>Prof. D. vs. Budgeting</td>
<td>0.785</td>
<td>High</td>
<td>0.000</td>
<td>Highly</td>
</tr>
<tr>
<td>Control vs. Budgeting</td>
<td>0.819</td>
<td>Very high</td>
<td>0.000</td>
<td>Highly</td>
</tr>
</tbody>
</table>
Management Strategies are very much influenced by the leadership of the administrators and this determined the change priorities and resource deployment. Strategies that sustain innovation one’s functional levels of adoption have been reached need to be developed (Hargreaves, 1999).

**Difference between the Perception of Faculty and Administrators**

This is the result of the difference between faculty and administrators’ perceptions as respondents in relation with the management strategies and the problems/obstacles.

It can be deduced in Table 15 that there is no significant differences between the perceptions of the faculty and administrators as respondents in the management strategies and obstacles. This is based on the t-value and level of significance as shown in the summary table.

The results show that the rating on the management in integrating technology is not influenced by the designation or position of the respondents. In that case, the variables that affect the management perception of the faculty are the same variables that affect the management perception of the administrators in technology integration. This means that the composition of the administrators as deans and assistants can also be categorized as faculty. One’s designation is related to academic function and true to the faculty of institution. As Miller (1988) suggests that school administrators should encourage teachers to develop a positive attitude about computers and to have minimum skills in using computers for educational purposes.

**Table 15. Summary of the Significant Difference between Management Strategies and The Problems/Obstacles as Perceived by Administrators and Faculty**

<table>
<thead>
<tr>
<th>MANAGEMENT AND OBSTACLES</th>
<th>T-VALUE</th>
<th>LEVEL OF SIGNIFICANCE</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLANNING</td>
<td>0.762</td>
<td>0.449</td>
<td>NOT SIGNIFICANT</td>
</tr>
<tr>
<td>INTEGRATING</td>
<td>0.583</td>
<td>0.562</td>
<td>NOT SIGNIFICANT</td>
</tr>
<tr>
<td>PROF. DEVELOPMENT</td>
<td>0.075</td>
<td>0.287</td>
<td>NOT SIGNIFICANT</td>
</tr>
<tr>
<td>CONTROL</td>
<td>0.769</td>
<td>0.445</td>
<td>NOT SIGNIFICANT</td>
</tr>
<tr>
<td>BUDGETING</td>
<td>0.369</td>
<td>0.714</td>
<td>NOT SIGNIFICANT</td>
</tr>
<tr>
<td>OVERALL MANAGEMENT</td>
<td>0.798</td>
<td>0.428</td>
<td>NOT SIGNIFICANT</td>
</tr>
<tr>
<td>OBSTACLES</td>
<td>0.574</td>
<td>0.568</td>
<td>NOT SIGNIFICANT</td>
</tr>
</tbody>
</table>
Administrators should be careful in the process of changing teacher attitudes. This process should be conducted so that teachers do not feel threatened in any way due to the introduction of computers in the classroom and such that they learn to appreciate the virtues of computers can make their teaching duties easier and more pleasing. Also, they should feel secure from the fear of job loss due to the integration of computers.

Furthermore, they should be reassured that their jobs will not be threatened in any way by computers, and that computers will rather complement their classroom instruction. Another step towards securing the trust and commitment of teachers to the technology integration endeavour is their inclusion in the decision-making process alongside the policy makers as from the start (Cuban, 2001).

Education reform has too often followed a top-down path whereby teachers have not been involved in decision-making. Decisions have been made for them by some higher authority taking on board their opinions and suggestions. Teachers tend to feel that policy makers do not understand the classroom dynamics and hence they do not know what works and what does not at the grassroots level. Consequently, teachers tend to resist the implementation of such decisions. Therefore, involving teachers, and school administrators, and the community for that matter, maximizes their sense of belonging to the integration process and hence their collaboration to the whole endeavour. Furthermore, technology has the potential for changing the way teachers teach and students learn (Thompson, Schmidt, & Davis, 2003), but research indicates that educators are less likely to use computers than the other professions (Hanushek, 1998). In addition, teachers play a major role in how successful technology will be in education (Yildirim & Kiraz, 1999).

1. Asd

2. The management strategies on integrating technology into instruction in State University and Colleges should include the corporate strategy for technology sourcing and financial support based on inputs from available technology and management as a whole. All the management strategies are interrelated and should be addressed as one in terms of planning, integrating technology, professional development, control and budgeting including corporate strategies. Failure of one leads to the failure of the entire management.

3. In order to minimize or reduce the occurrence of obstacles in technology integration, the management should be strengthened and increase in terms of implementation, efficiency and effectiveness. As management increases, the occurrence of obstacles decreases.

4. Faculty with highest academic rank and educational attainment are good managers and administrators in implementing technology integration.

5. There is a need to conduct further study on technology, learning and leading to educational imperatives for a 21st century. This is recognizing the changes in environment that are possible as a result of the presence of technology and its potential impact on learning using the proposed programs and model in the management of integrating technology.

6. Proposed programs for technology planning guides and model in management integration should be adopted or serve as reference for all SUC-ARMM.

A proposed Model in Management on Integrating Technology into Instruction in State Universities and Colleges (SUCs) in the Autonomous Region in Muslim Mindanao

Just like any project, technology integration in educational settings requires an implementation plan. Without a needs-analysis, proper planning and management activities, projects are doomed to slow
progress or outright failure. Levine (1998) emphasizes the importance of having a plant that is based on real school needs and one that is realistic, achievable, and effective. The plan should be produced, not for the sole purpose of putting technology in the classroom but to reflect the real needs of schools in order to make effective technology deployment and to produce enhanced learning environments. The involvement of all stakeholders in the preparation and execution of the plan has been identified as a catalyst in the integration process.

A. Technology Planning Guide

Many planning guides are now available to assist to systematically examine policy priorities and develop strategies for integrating technology in the State Universities and Colleges Development Plan. These guides usually propose that Colleges (a) develop a vision about technology in the curriculum; (b) undertake a “needs assessment” of current issues of technology integration; (c) identify goals relating to technology and outline how these support the overall college plan; (d) propose a plan (budget, Physical resources, Professional development, outsourcing) to achieve these goals; (e) outline an implementation strategy (short and long term) to accomplish the plan; and (f) outline ways in which the technology plan as a whole will be evaluated.

B. Model for Management Strategy of Technology Integration in SUCs

The following is a proposed model for management strategy of technology integration in the SUCs with the role functions of each block that the researcher proposes:

**Figures 17. A Proposed Model for Management Strategy of Technology Instruction in the SUCs**

- **Management** – Provides leadership in terms of formulating policies, implementing technology and change management to achieve organization objectives.
- **Technology** – technology itself and its infrastructure can affect the way managers formulate corporate strategies and the integration in instruction.
- **Instruction** – involves curriculum development and classroom dynamics in the implementation of technology integration.
- **Corporate Strategy** – in response to business challenge, can formulate strategies based on inputs from management, instruction and technology.

Because of the ever decreasing budget allocation in all State Universities and Colleges, the management should include corporate strategy for survival and maintenance of the technology resources. This will affect the reduction of more problems/obstacles in the management of integrating technology in instruction. After all, cost saving and autonomy are still the by word in higher education institutions. Kershaw (1996) believes successful technology integration focuses on managing change effectively. It is about people-changing how they work and view their role in the organization. She outlines a three-step change process. This process begins with individuals understanding that change is needed. Next, individuals must understand that they must change. And finally, the individuals actually change. Kershaw (1996) also describes several strategies for managing this change process. These include “articulation of a vision, the development of a plan, the creation of appropriate organizational structures, the provision of adequate training and support, and the promotion of the use of technology for a variety of purposes.
Aviram (2000) argues that the introduction of technology into education has often carried out with vogue and confused conceptions of the desired model of learning which the new technologies were supposed to enhance and without clear conception of any grading educational values. He contends that lack of integration of technology in schools has also resulted from serious structural obstacles built into the organization of current forms of schooling which prevent real change in learning methods necessary to take advantage of new technology. The views held by policy makers and teachers about the role of technology in education differ in many cases. On the issue of cost and financial mechanisms, there are various categories that need analysis in the calculation of financial investment. These include: (1) hardware, (2) software, (3) connectivity, on-going maintenance and technical support including personnel, (4) professional development and training, (5) facilities, locale, and renovation, and (6) project management cost (Bakia, 2002). It would be suicidal not to consider all of these various categories receives more attention to the detriment of the others, the project could collapse. Funding is an important ingredient to the successful integration of technology in the classroom. Cheever et al. (1986) identify six sources of funding. These are:

1. School budget: the first place to look for funds is the school’s operating budget. However, due to limitations of this fund, large purchases of technological devices are difficult.

2. Bond Issues: school districts also have capital budgets, apart from the operating budgets for schools, usually targeted toward the funding of major projects such as the construction of a new school and other facilities. Capital budgets can be obtained through floating bonds.

3. Educational collaborations: Through collaborative efforts among schools and other organizations, both local and foreign, funds can be raised and provided to schools. Also, school district can purchase technological devices like computers and printers in bulk form a single vendor so as to reduce the purchasing costs. Through collaborative efforts, educational software can also be developed or purchased.

4. Federal or State Funds: if the government has a vision of improving education and integrating computers in education and if it is committed to this vision, then the task of getting government funding should also be explored.

5. Corporate Grants: Many wealthy companies receive tax deductions, along with societal recognition and costumer market, for the help, in funds or other financially quantifiable terms, they give me to institutions to achieve the latter’s goals.

6. Private Gifts: Financial support can also be obtained from private sources such as parents teachers association, civic groups or individuals or alumni, special fund raising event.

Added to this list could be international donor organizations such as USAID, World Bank, and UNESCO. These sources can be exploited by developing countries to obtain funds towards the equipment of schools with computers (Haddad and Jurich, 2002). Opening school computer laboratories after school hours to the community can also be a source of finance (Hawkins, 2002).

**REFERENCE**


